REMARKS

Favorable reconsideration and reexamination of this application are requested in view of the above amendments and the following remarks. Claims 1 and 2 are hereby amended.

The amendment of claim 2, reciting "wherein the first and second pulse signals are provided with the same frequency and different phases", is supported by page 20, lines 24-25 and Figure 9. Claims 1 and 2 are further amended editorially.

Claims 1-2 were rejected under 35 USC 102(b) as being anticipated by Miyazawa (US 5,554,914). Miyazawa does not disclose a steering apparatus including first and second drive circuits that each includes a switching element that switches on and off at a control frequency that is provided by a controller, as required by claim 1. See Figures 12F and 12G of Miyazawa, showing the driving pulses for the motors (64, 66). One knowledgeable in the art would not consider these drive pulses to be provided at different frequencies. In contrast, the invention of claim 1 provides different frequencies to each of the motors so as to prevent the respective switching elements of the drive circuits from being switched on and off at the same time (see page 19, lines 19-22 and Figure 8).

Further, Miyazawa does not disclose a controller for a steering apparatus that provides pulse signals with the same frequency and different phases for each of the respective motors, as required by claim 2. Rather, Miyazawa discloses a motor driving control circuit (58) for a micro robot which provides driving pulses exhibiting different frequencies (see Figures 12F and 12G).

Miyazawa discloses a plurality of motors adapted to be driven on the basis of driving pulses of different frequencies in order to control a micro robot for the purpose of reducing power consumption (see column 14, lines 18-36). In contrast, the steering

apparatus invention of claims 1 and 2 provides a control frequency or a shape of a pulse signal that is different for the first motor and for the second motor, thereby preventing switching from occurring at the same time. This configuration reduces the peaks of the switching noise levels, thereby decreasing any discomfort to the driver due to switching noise or magnetostrictive sound that may be produced from the respective drive circuits of two electric motors employed in a single electric power steering system.

One knowledgeable in the art would not look to Miyazawa to disclose a steering apparatus for a vehicle. Miyazawa discloses control of a micro robot. The concerns and problems to address are quite different for a micro robot than that for a vehicle employing a single electric power steering system.

Even further, the difference in timing disclosed by Miyazawa is relatively quite different from that disclosed in the current invention. When two motors are PWM-driven at different frequencies, power consumption decreases from the microscopic point of view (when considering a very short period of time). However, from the macroscopic point of view (when considering a relatively long period of time, such as several seconds), no substantial difference in the electric power consumption occurs. Therefore, in order to reduce power consumption of the power source portion (16), a disclosed goal of Miyazawa, it is necessary to differentiate the frequencies of the drive signals for the plurality of motors for a relatively long period of time (in the order of several seconds), but not for a short period of time as applicable to two motors that are PWM driven. Therefore, the switching disclosed by Miyazawa, that of switching-over driving of each individual motor for a micro robot, is not applicable when driving two electric motors of an electric power steering system where the goal is to apply a desired steering assist torque.

Since, Miyazawa does not disclose all of the elements of the claimed steering apparatus, the reference cannot be considered to anticipate the rejected claims. Favorable reconsideration and reexamination of claims 1 and 2 are requested.

In view of the above, early issuance of a notice of allowance is solicited. Any questions regarding this communication can be directed to the undersigned attorney, Curtis B. Hamre, Reg. 29,165, at (612)455-3802.

Respectfully Submitted,

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